```
Enter the number of messages to simulate: 10

Enter packet loss probability [enter 0.0 for no loss]:0

Enter packet corruption probability [0.0 for no corruption]:0

Enter average time between messages from sender's layer5 [ > 0.0]:1000

Enter TRACE:1

A received aaaaaaaaaaaaaaaaaa from application layer

B received a packet (SEQ: 0, ACK: 0, Checksum: 1843, Payload: aaaaaaaaaaaaaaaaaa) from network layer layer

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer

A received bbbbbbbbbbbbbbbbbb from application layer

B received a packet (SEQ: 1, ACK: 0, Checksum: 1863, Payload: bbbbbbbbbbbbbbbbbb) from network layer layer

A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer

A received a packet (SEQ: 1, ACK: 0, Checksum: 1863, Payload: bbbbbbbbbbbbbbbbbb) from network layer layer

A received cccccccccccccccccc from application layer

B received a packet (SEQ: 0, ACK: 0, Checksum: 1881, Payload: cccccccccccccccccc) from network layer layer

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer

A received dddddddddddddddddd from application layer

B received a packet (SEQ: 1, ACK: 0, Checksum: 1901, Payload: dddddddddddddddddd) from network layer layer

A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer

A received a packet (SEQ: 1, ACK: 0, Checksum: 1901, Payload: dddddddddddddddddd) from network layer layer

A received eeeeeeeeeeeeeeeeee from application layer

B received a packet (SEQ: 0, ACK: 0, Checksum: 1919, Payload: eeeeeeeeeeeeeeeeee) from network layer layer

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer

A received ffffffffffffffffff from application layer

B received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: ffffffffffffffffff) from network layer layer

A received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: ffffffffffffffffff) from network layer layer

A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer

A received gggggggggggggggggg from application layer

B received a packet (SEQ: 0, ACK: 0, Checksum: 1957, Payload: gggggggggggggggggg) from network layer layer

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer

A received hhhhhhhhhhhhhhhhhh from application layer

B received a packet (SEQ: 1, ACK: 0, Checksum: 1977, Payload: hhhhhhhhhhhhhhhhhh) from network layer layer

A received a packet (SEQ: 1, ACK: 0, Checksum: 1977, Payload: hhhhhhhhhhhhhhhhhh) from network layer layer

A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer

A received iiiiiiiiiiiiiiiiii from application layer

B received a packet (SEQ: 0, ACK: 0, Checksum: 1995, Payload: iiiiiiiiiiiiiiiiii) from network layer layer

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer

A received jjjjjjjjjjjjjjjjjj from application layer
```

Commented [DTM1]: Sender A, being in the Wait For Call 1 From Above State, received message from application layer to send. A takes encapsulates message and sends it to B.

Commented [DTM2]: Receiver B, being in the Wait for Seq 1 from Below state, received packet from network layer. As Seq and Checksum were as expected, B sends data to application layer, makes ACK 1 packet, and sends it to A. B then transitions into Wait for Seq 0 state.

Commented [DTM3]: Sender A, being in the Wait For Ack 1 state, received ACK 1 with checksum as expected. A stops timer and changes to Wait for Call 0 state.

```
Enter the number of messages to simulate: 10

Enter packet loss probability [enter 0.0 for no loss]: .25

Enter packet corruption probability [0.0 for no corruption]:0

Enter average time between messages from sender's layer5 [ > 0.0]:1000

Enter TRACE:1

A received aaaaaaaaaaaaaaaaaa from application layer

B received a packet (SEQ: 0, ACK: 0, Checksum: 1843, Payload: aaaaaaaaaaaaaaaaaa) from network layer layer

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer

A received bbbbbbbbbbbbbbbbbb from application layer

TOLAYER3: PACKET BEING LOST

A: Timer Interrupt

B received a packet (SEQ: 1, ACK: 0, Checksum: 1863, Payload: bbbbbbbbbbbbbbbbbb) from network layer layer

TOLAYER3: PACKET BEING LOST

TOLAYER3: PACKET BEING LOST

A: Timer Interrupt

B received a packet (SEQ: 1, ACK: 0, Checksum: 1863, Payload: bbbbbbbbbbbbbbbbbb) from network layer layer

A received a packet (SEQ: 1, ACK: 0, Checksum: 1863, Payload: bbbbbbbbbbbbbbbbbb) from network layer layer

A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer

A received cccccccccccccccccc from application layer

B received a packet (SEQ: 0, ACK: 0, Checksum: 1881, Payload: cccccccccccccccccc) from network layer layer

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer

A received dddddddddddddddddd from application layer

B received a packet (SEQ: 1, ACK: 0, Checksum: 1901, Payload: dddddddddddddddddd) from network layer layer

TOLAYER3: PACKET BEING LOST

A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer

A received eeeeeeeeeeeeeeeeee from application layer

B received a packet (SEQ: 0, ACK: 0, Checksum: 1919, Payload: eeeeeeeeeeeeeeeeee) from network layer layer

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer

A received ffffffffffffffffff from application layer

B received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: ffffffffffffffffff) from network layer layer

TOLAYER3: PACKET BEING LOST

A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer

A received gggggggggggggggggg from application layer

TOLAYER3: PACKET BEING LOST

A: Timer Interrupt

B received a packet (SEQ: 0, ACK: 0, Checksum: 1957, Payload: gggggggggggggggggg) from network layer layer

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer

A received hhhhhhhhhhhhhhhhhh from application layer

B received a packet (SEQ: 1, ACK: 0, Checksum: 1977, Payload: hhhhhhhhhhhhhhhhhh) from network layer layer

A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer

A received a packet (SEQ: 1, ACK: 0, Checksum: 1977, Payload: hhhhhhhhhhhhhhhhhh) from network layer layer
```
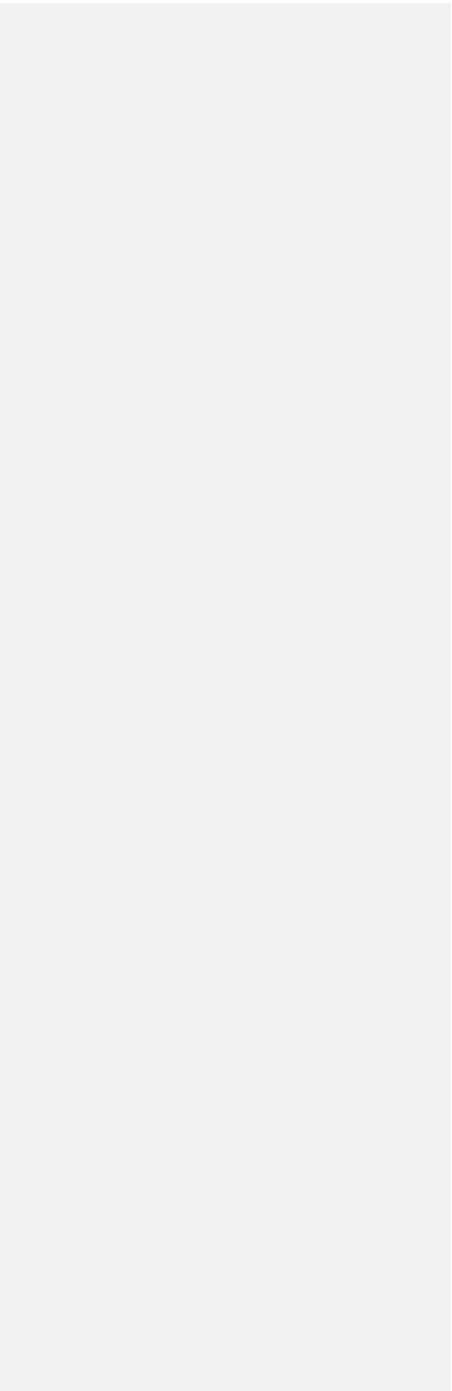
A received iiiiiiiiiiiiiiiiiii from application layer

B received a packet (SEQ: 0, ACK: 0, Checksum: 1995, Payload: iiiiiiiiiiiiiiiiiii) from network layer layer

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload:) from network layer layer

A received jjjjjjjjjjjjjjjjjjjj from application layer

```
Enter the number of messages to simulate: 10

Enter  packet loss probability [enter 0.0 for no loss]:0

Enter packet corruption probability [0.0 for no corruption]:.25

Enter average time between messages from sender's layer5 [ > 0.0]:1000

Enter TRACE:1

A received aaaaaaaaaaaaaaaaaaaa from application layer

B received a packet (SEQ: 0, ACK: 0, Checksum: 1843, Payload: aaaaaaaaaaaaaaaaaaaa) from network layer layer

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer

A received bbbbbbbbbbbbbbbbbbbb from application layer

TOLAYER3: PACKET BEING CORRUPTED

CORRUPTING PACKET SEGMENT NUMBER

B received a packet (SEQ: 999999, ACK: 0, Checksum: 1863, Payload: bbbbbbbbbbbbbbbbbbbb) from network layer layer

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer

A: Timer Interrupt

B received a packet (SEQ: 1, ACK: 0, Checksum: 1863, Payload: bbbbbbbbbbbbbbbbbbbb) from network layer layer

A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer

A received a packet (SEQ: 1, ACK: 0, Checksum: 1863, Payload: bbbbbbbbbbbbbbbbbbbb) from network layer layer

A received cccccccccccccccccccc from application layer

TOLAYER3: PACKET BEING CORRUPTED

CORRUPTING PACKET DATA

B received a packet (SEQ: 0, ACK: 0, Checksum: 1881, Payload: ccccccccccccccccccccZ) from network layer layer

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer

A received dddddddddddddddddddd from application layer

B received a packet (SEQ: 1, ACK: 0, Checksum: 1901, Payload: dddddddddddddddddddd) from network layer layer

A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer

A received a packet (SEQ: 1, ACK: 0, Checksum: 1901, Payload: dddddddddddddddddddd) from network layer layer

A received eeeeeeeeeeeeeeeeeeee from application layer

B received a packet (SEQ: 0, ACK: 0, Checksum: 1919, Payload: eeeeeeeeeeeeeeeeeeee) from network layer layer

TOLAYER3: PACKET BEING CORRUPTED

CORRUPTING PACKET DATA

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: Z) from network layer layer

A: Timer Interrupt

B received a packet (SEQ: 0, ACK: 0, Checksum: 1919, Payload: eeeeeeeeeeeeeeeeeeee) from network layer layer

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer

A received ffffffffffffffffffff from application layer

TOLAYER3: PACKET BEING CORRUPTED

CORRUPTING PACKET DATA

B received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: ffffffffffffffffffffZ) from network layer layer

TOLAYER3: PACKET BEING CORRUPTED

CORRUPTING PACKET DATA

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: Z) from network layer layer
```

Commented [DTM11]: SEQ number corrupted

Commented [DTM12]: As A does not receive a proper ACK, times out, and resends

Commented [DTM13]: Duplicate packet received and successfully ACKd

```
A: Timer Interrupt

B received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: ffffffffffffffffff) from network layer layer

TOLAYER3: PACKET BEING CORRUPTED

CORRUPTING PACKET DATA

A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: Z) from network layer layer

A received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: ffffffffffffffffff) from network layer layer

A: Timer Interrupt

B received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: ffffffffffffffffff) from network layer layer

TOLAYER3: PACKET BEING CORRUPTED

CORRUPTING PACKET ACK NUMBER

A received a packet (SEQ: 0, ACK: 999999, Checksum: 1, Payload: ) from network layer layer

A received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: ffffffffffffffffff) from network layer layer

A: Timer Interrupt

B received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: ffffffffffffffffff) from network layer layer

TOLAYER3: PACKET BEING CORRUPTED

CORRUPTING PACKET DATA

TOLAYER3: PACKET BEING CORRUPTED

CORRUPTING PACKET DATA

A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: Z) from network layer layer

A received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: ffffffffffffffffffZ) from network layer layer

A: Timer Interrupt

TOLAYER3: PACKET BEING CORRUPTED

CORRUPTING PACKET DATA

B received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: ffffffffffffffffffZ) from network layer layer

TOLAYER3: PACKET BEING CORRUPTED

CORRUPTING PACKET DATA

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: Z) from network layer layer

A: Timer Interrupt

B received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: ffffffffffffffffff) from network layer layer

TOLAYER3: PACKET BEING CORRUPTED

CORRUPTING PACKET ACK NUMBER

TOLAYER3: PACKET BEING CORRUPTED

CORRUPTING PACKET DATA

A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: Z) from network layer layer

A received a packet (SEQ: 1, ACK: 999999, Checksum: 1939, Payload: ffffffffffffffffff) from network layer layer

A: Timer Interrupt

B received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: ffffffffffffffffff) from network layer layer

TOLAYER3: PACKET BEING CORRUPTED

CORRUPTING PACKET DATA

A received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: ffffffffffffffffffZ) from network layer layer

A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer
```

A received ggggggggggggggggggggg from application layer

B received a packet (SEQ: 0, ACK: 0, Checksum: 1957, Payload: ggggggggggggggggggggg) from network layer layer

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload:) from network layer layer

A received hhhhhhhhhhhhhhhhhhhh from application layer

B received a packet (SEQ: 1, ACK: 0, Checksum: 1977, Payload: hhhhhhhhhhhhhhhhhhhh) from network layer layer

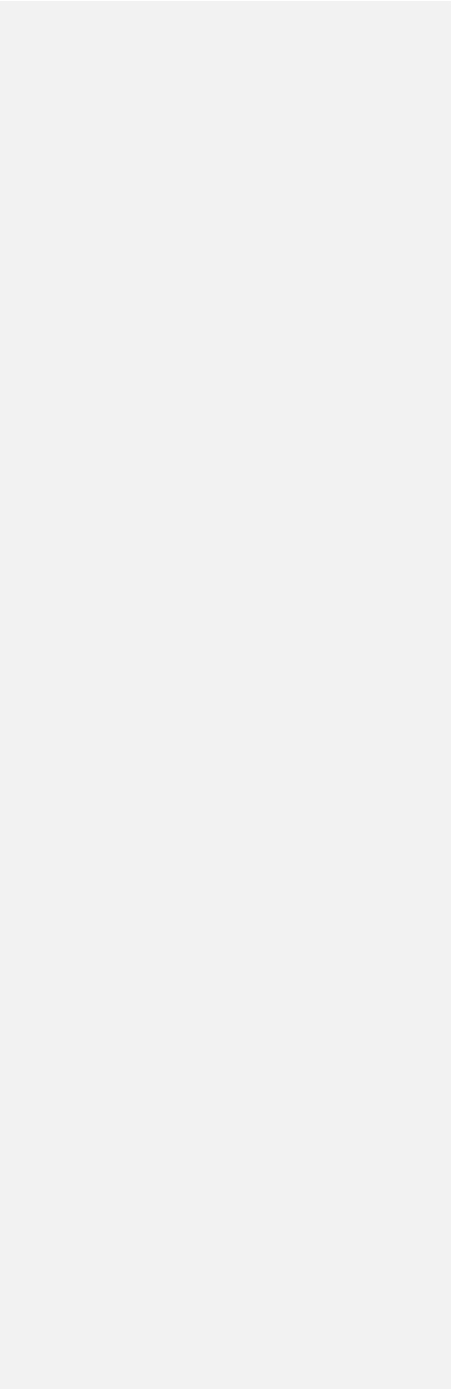A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload:) from network layer layer

A received a packet (SEQ: 1, ACK: 0, Checksum: 1977, Payload: hhhhhhhhhhhhhhhhhhhh) from network layer layer

A received iiiiiiiiiiiiiiiiiiii from application layer

B received a packet (SEQ: 0, ACK: 0, Checksum: 1995, Payload: iiiiiiiiiiiiiiiiiiii) from network layer layer

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload:) from network layer layer

A received jjjjjjjjjjjjjjjjjjjj from application layer

Enter the number of messages to simulate: 10

Enter packet loss probability [enter 0.0 for no loss]:.25

Enter packet corruption probability [0.0 for no corruption]:.25

Enter average time between messages from sender's layer5 [> 0.0]:1000

Enter TRACE:1

A received aaaaaaaaaaaaaaaaaaa from application layer

TOLAYER3: PACKET BEING LOST

A: Timer Interrupt

B received a packet (SEQ: 0, ACK: 0, Checksum: 1843, Payload: aaaaaaaaaaaaaaaaaaa) from network layer layer

TOLAYER3: PACKET BEING LOST

A: Timer Interrupt

B received a packet (SEQ: 0, ACK: 0, Checksum: 1843, Payload: aaaaaaaaaaaaaaaaaaa) from network layer layer

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload:) from network layer layer

A received bbbbbbbbbbbbbbbbbbbb from application layer

TOLAYER3: PACKET BEING LOST

A: Timer Interrupt

B received a packet (SEQ: 1, ACK: 0, Checksum: 1863, Payload: bbbbbbbbbbbbbbbbbbbb) from network layer layer

TOLAYER3: PACKET BEING LOST

TOLAYER3: PACKET BEING LOST

A: Timer Interrupt

B received a packet (SEQ: 1, ACK: 0, Checksum: 1863, Payload: bbbbbbbbbbbbbbbbbbbb) from network layer layer

TOLAYER3: PACKET BEING CORRUPTED

CORRUPTING PACKET DATA

A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: Z) from network layer layer

A received a packet (SEQ: 1, ACK: 0, Checksum: 1863, Payload: bbbbbbbbbbbbbbbbbbbb) from network layer layer

A: Timer Interrupt

TOLAYER3: PACKET BEING CORRUPTED

CORRUPTING PACKET DATA

B received a packet (SEQ: 1, ACK: 0, Checksum: 1863, Payload: bbbbbbbbbbbbbbbbbbbbZ) from network layer layer

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload:) from network layer layer

A: Timer Interrupt

B received a packet (SEQ: 1, ACK: 0, Checksum: 1863, Payload: bbbbbbbbbbbbbbbbbbbb) from network layer layer

A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload:) from network layer layer

A received a packet (SEQ: 1, ACK: 0, Checksum: 1863, Payload: bbbbbbbbbbbbbbbbbbbb) from network layer layer

A received cccccccccccccccccccc from application layer

TOLAYER3: PACKET BEING LOST

A: Timer Interrupt

TOLAYER3: PACKET BEING LOST

A: Timer Interrupt

TOLAYER3: PACKET BEING LOST

A: Timer Interrupt

Commented [DTM18]: A receives bbbbb from app layer, tries to send to b

Commented [DTM19]: Which is then resent and received

Commented [DTM20]: But has its ACK lost twice

Commented [DTM21]: So B is sent a duplicate packet, tries to ACK

Commented [DTM22]: But its ACK is corrupted

Commented [DTM23]: So A resends packet

Commented [DTM24]: But is then corrupted

Commented [DTM25]: A times out, resends packet

Commented [DTM26]: Which is then successfully received and acked

```
TOLAYER3: PACKET BEING LOST
A: Timer Interrupt
TOLAYER3: PACKET BEING LOST
A: Timer Interrupt
B received a packet (SEQ: 0, ACK: 0, Checksum: 1881, Payload: cccccccccccccccccccc) from network layer layer
A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer
A received dddddddddddddddddddd from application layer
B received a packet (SEQ: 1, ACK: 0, Checksum: 1901, Payload: dddddddddddddddddddd) from network layer layer
TOLAYER3: PACKET BEING CORRUPTED
CORRUPTING PACKET DATA
A received a packet (SEQ: 1, ACK: 0, Checksum: 1901, Payload: ddddddddddddddddddddZ) from network layer layer
A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer
A received eeeeeeeeeeeeeeeeeeee from application layer
B received a packet (SEQ: 0, ACK: 0, Checksum: 1919, Payload: eeeeeeeeeeeeeeeeeeee) from network layer layer
A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer
A received ffffffffffffffffffff from application layer
TOLAYER3: PACKET BEING LOST
A: Timer Interrupt
B received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: ffffffffffffffffffff) from network layer layer
TOLAYER3: PACKET BEING CORRUPTED
CORRUPTING PACKET DATA
A received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: ffffffffffffffffffff) from network layer layer
A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: Z) from network layer layer
A: Timer Interrupt
B received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: ffffffffffffffffffff) from network layer layer
A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer
A received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: ffffffffffffffffffff) from network layer layer
A received gggggggggggggggggggg from application layer
B received a packet (SEQ: 0, ACK: 0, Checksum: 1957, Payload: gggggggggggggggggggg) from network layer layer
TOLAYER3: PACKET BEING CORRUPTED
CORRUPTING PACKET DATA
A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: Z) from network layer layer
A: Timer Interrupt
B received a packet (SEQ: 0, ACK: 0, Checksum: 1957, Payload: gggggggggggggggggggg) from network layer layer
A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer
A received hhhhhhhhhhhhhhhhhhhh from application layer
TOLAYER3: PACKET BEING CORRUPTED
CORRUPTING PACKET DATA
B received a packet (SEQ: 1, ACK: 0, Checksum: 1977, Payload: hhhhhhhhhhhhhhhhhhhhZ) from network layer layer
A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer
A: Timer Interrupt
```

```
TOLAYER3: PACKET BEING LOST

A: Timer Interrupt

B received a packet (SEQ: 1, ACK: 0, Checksum: 1977, Payload: hhhhhhhhhhhhhhhhhh) from network layer layer

TOLAYER3: PACKET BEING CORRUPTED

CORRUPTING PACKET DATA

A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer

A received a packet (SEQ: 1, ACK: 0, Checksum: 1977, Payload: hhhhhhhhhhhhhhhhhhhZ) from network layer layer

A received iiiiiiiiiiiiiiiiiii from application layer

B received a packet (SEQ: 0, ACK: 0, Checksum: 1995, Payload: iiiiiiiiiiiiiiiiiii) from network layer layer

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer

A received jjjjjjjjjjjjjjjjjjjj from application layer
```